Space Weather Forecast

Issued on Wednesday, 22 May 2024 at 11:34 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Please note: On the 22 May between 1400 UTC and 1900 UTC, a significant data outage at NOAA SWPC is expected which will impact most of our observational data feeds and some models. We may receive data intermittently through that period. MOSWOC service will continue on contingency. Alerts and warnings will be sent using alternative data, if available. The planned data outage may be postponed in the event of significant space weather.

Space Weather Forecast Headline: Isolated Moderate-class flares likely throughout. Slight chance G1 Minor Storm day 3-4 (24-25 May) from the arrival of fast winds from a coronal hole.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: The activity was Moderate, with one Moderate-class flare observed from a region that has recently cross the south-west limb and the other one from the complex region in the western central part. There are eight sunspot regions on the disc. Most notable is the region in the western central part, which has maintained a small delta-configuration to the north of its leader. Its trailer spots, consisting of a further bipolar pair, also show some very slightly mixed polarities within their local intermediate region. The other larger spot is the one nearing the south-centre disc, however this appears to be a mature region with little ongoing development, beyond the emergence of a small bipolar pair of spots on its southern periphery.

No Earth-directed coronal mass ejections (CMEs) were observed in available imagery. However, a large filament currently lies over the southeast quadrant. It looks unstable and will need to be monitored in case of eruption.

Solar Wind / Geomagnetic Activity: Solar winds have been indicative of ongoing slow wind conditions. The solar wind speed was around 380-420km/s initially but has been generally declining towards background levels since 22/0400 UTC to reach 340 km/s. Interplanetary Magnetic Field (IMF) was weak with the north-south component perhaps slightly favouring a positive (northward) orientation but remaining weak. Geomagnetic activity was Quiet to Unsettled (Kp 1-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained well below S1/Minor Radiation Storm. A very slight increase was seen after a far-sided eruption on 20 May, however this has now eased.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate activity is likely to continue with isolated Moderate flares possible each day, and a slight chance of rising to High due to any Strong-class flares. These most likely from the two larger spots on the disc, one in the southwest and another near the south-centre disc. A returning region is also expected on the northeast by the end of the period. This region was the source of five Strong-class flares as it rotated off the visible disc a couple of weeks ago. It is

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uncertain how much this region has survived its journey across the far-side however.

Solar Wind / Geomagnetic Activity: There are no Earth directed CMEs. Slightly elevated to background solar winds are expected to persist until day 3-4 (24-25 May), before the onset of fast solar winds from the southward extension of the northern hemisphere coronal hole. The strength and timing of any enhancement is low confidence, however. Mainly Quiet activity is expected with only isolated Unsettled intervals, but likely rising to Active with a slight chance of G1 Minor Storm intervals from any fast solar winds, most likely day 4 (25 May).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to persist at background with only a very slight chance of rising to S1/Minor Radiation Storm.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	10	20
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	75	70	60	60
Very Active	R3 to R5 X	No	10	10	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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